



SEQUENCE LISTING

<110> Currie, Mark G.
Mahajan-Miklos, Shalina

<120> METHODS AND COMPOSITIONS FOR THE
TREATMENT OF GASTROINTESTINAL DISORDERS

<130> 14184-039001

<140> US 10/766,735

<141> 2004-01-28

<150> US 60/443,098

<151> 2003-01-28

<150> US 60/471,288

<151> 2003-05-15

<150> US 60/519,460

<151> 2003-11-12

<160> 124

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 19

<212> PRT

<213> Escherichia coli

<400> 1

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| Asn | Ser | Ser | Asn | Tyr | Cys | Cys | Glu | Leu | Cys | Cys | Asn | Pro | Ala | Cys | Thr |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Gly | Cys | Tyr | | | | | | | | | | | | | |

<210> 2

<211> 18

<212> PRT

<213> Escherichia coli

<400> 2

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Thr | Phe | Tyr | Cys | Cys | Glu | Leu | Cys | Cys | Asn | Pro | Ala | Cys | Ala | Gly |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Cys | Tyr | | | | | | | | | | | | | | |

<210> 3

<211> 18

<212> PRT

<213> Escherichia coli

<400> 3

Asn Thr Phe Tyr Cys Cys Glu Leu Cys Cys Tyr Pro Ala Cys Ala Gly
 1 5 10 15
 Cys Asn

<210> 4
 <211> 18
 <212> PRT
 <213> *Citrobacter freundii*

<400> 4
 Asn Thr Phe Tyr Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Ala Gly
 1 5 10 15
 Cys Tyr

<210> 5
 <211> 30
 <212> PRT
 <213> *Yersinia enterocolitica*

<400> 5
 Gln Ala Cys Asp Pro Pro Ser Pro Pro Ala Glu Val Ser Ser Asp Trp
 1 5 10 15
 Asp Cys Cys Asp Val Cys Cys Asn Pro Ala Cys Ala Gly Cys
 20 25 30

<210> 6
 <211> 30
 <212> PRT
 <213> *Yersinia enterocolitica*

<400> 6
 Lys Ala Cys Asp Thr Gln Thr Pro Ser Pro Ser Glu Glu Asn Asp Asp
 1 5 10 15
 Trp Cys Cys Glu Val Cys Cys Asn Pro Ala Cys Ala Gly Cys
 20 25 30

<210> 7
 <211> 53
 <212> PRT
 <213> *Yersinia enterocolitica*

<400> 7
 Gln Glu Thr Ala Ser Gly Gln Val Gly Asp Val Ser Ser Ser Thr Ile
 1 5 10 15
 Ala Thr Glu Val Ser Glu Ala Glu Cys Gly Thr Gln Ser Ala Thr Thr
 20 25 30
 Gln Gly Glu Asn Asp Trp Asp Trp Cys Cys Glu Leu Cys Cys Asn Pro
 35 40 45
 Ala Cys Phe Gly Cys
 50

<210> 8
 <211> 16
 <212> PRT
 <213> *Yersinia kristensenii*

<400> 8

Ser Asp Trp Cys Cys Glu Val Cys Cys Asn Pro Ala Cys Ala Gly Cys
1 5 10 15

<210> 9

<211> 17

<212> PRT

<213> *Vibrio cholerae*

<400> 9

Ile Asp Cys Cys Glu Ile Cys Cys Asn Pro Ala Cys Phe Gly Cys Leu
1 5 10 15
Asn

<210> 10

<211> 17

<212> PRT

<213> *Vibrio mimicus*

<400> 10

Ile Asp Cys Cys Glu Ile Cys Cys Asn Pro Ala Cys Phe Gly Cys Leu
1 5 10 15
Asn

<210> 11

<211> 18

<212> PRT

<213> *Escherichia coli*

<400> 11

Asn Thr Phe Tyr Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Ala Pro
1 5 10 15
Cys Tyr

<210> 12

<211> 13

<212> PRT

<213> *Vibrio cholerae*

<400> 12

Ile Asp Cys Cys Glu Ile Cys Cys Asn Pro Ala Cys Phe
1 5 10

<210> 13

<211> 14

<212> PRT

<213> *Vibrio cholerae*

<400> 13

Ile Asp Cys Cys Glu Ile Cys Cys Asn Pro Ala Cys Phe Gly
1 5 10

<210> 14

<211> 17
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 <213> *Vibrio mimicus*

<400> 14
 Ile Asp Cys Cys Glu Ile Cys Cys Asn Pro Ala Cys Phe Gly Cys Leu
 1 5 10 15
 Asn

<210> 15
 <211> 17
 <212> PRT
 <213> *Vibrio mimicus*

<400> 15
 Ile Asp Arg Cys Glu Ile Cys Cys Asn Pro Ala Cys Phe Gly Cys Leu
 1 5 10 15
 Asn

<210> 16
 <211> 16
 <212> PRT
 <213> *Yersinia enterocolitica*

<400> 16
 Asp Trp Asp Cys Cys Asp Val Cys Cys Asn Pro Ala Cys Ala Gly Cys
 1 5 10 15

<210> 17
 <211> 16
 <212> PRT
 <213> *Yersinia enterocolitica*

<400> 17
 Asp Trp Asp Cys Cys Asp Val Cys Cys Asn Pro Ala Cys Ala Gly Cys
 1 5 10 15

<210> 18
 <211> 17
 <212> PRT
 <213> *Yersinia enterocolitica*

<400> 18
 Asn Asp Asp Trp Cys Cys Glu Val Cys Cys Asn Pro Ala Cys Ala Gly
 1 5 10 15
 Cys

<210> 19
 <211> 16
 <212> PRT
 <213> *Yersinia enterocolitica*

<400> 19
 Trp Asp Trp Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Phe Gly Cys

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1           5           10           15
<210> 20
<211> 72
<212> PRT
<213> Escherichia coli

<400> 20
Met Lys Lys Leu Met Leu Ala Ile Phe Ile Ser Val Leu Ser Phe Pro
1           5           10           15
Ser Phe Ser Gln Ser Thr Glu Ser Leu Asp Ser Ser Lys Glu Lys Ile
20           25           30
Thr Leu Glu Thr Lys Lys Cys Asp Val Val Lys Asn Asn Ser Glu Lys
35           40           45
Lys Ser Glu Asn Met Asn Asn Thr Phe Tyr Cys Cys Glu Leu Cys Cys
50           55           60
Asn Pro Ala Cys Ala Gly Cys Tyr
65           70

<210> 21
<211> 72
<212> PRT
<213> Escherichia coli

<400> 21
Met Lys Lys Ser Ile Leu Phe Ile Phe Leu Ser Val Leu Ser Phe Ser
1           5           10           15
Pro Phe Ala Gln Asp Ala Lys Pro Val Glu Ser Ser Lys Glu Lys Ile
20           25           30
Thr Leu Glu Ser Lys Lys Cys Asn Ile Ala Lys Lys Ser Asn Lys Ser
35           40           45
Gly Pro Glu Ser Met Asn Ser Ser Asn Tyr Cys Cys Glu Leu Cys Cys
50           55           60
Asn Pro Ala Cys Thr Gly Cys Tyr
65           70

<210> 22
<211> 71
<212> PRT
<213> Yersinia enterocolitica

<400> 22
Met Lys Lys Ile Val Phe Val Leu Val Leu Met Leu Ser Ser Phe Gly
1           5           10           15
Ala Phe Gly Gln Glu Thr Val Ser Gly Gln Phe Ser Asp Ala Leu Ser
20           25           30
Thr Pro Ile Thr Ala Glu Val Tyr Lys Gln Ala Cys Asp Pro Pro Leu
35           40           45
Pro Pro Ala Glu Val Ser Ser Asp Trp Asp Cys Cys Asp Val Cys Cys
50           55           60
Asn Pro Ala Cys Ala Gly Cys
65           70

<210> 23
<211> 54
<212> PRT
<213> Artificial Sequence

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<220>

<223> Synthetically generated amino terminal leader
sequence

<400> 23

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Lys | Lys | Ser | Ile | Leu | Phe | Ile | Phe | Leu | Ser | Val | Leu | Ser | Phe | Ser |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Pro | Phe | Ala | Gln | Asp | Ala | Lys | Pro | Val | Glu | Ser | Ser | Lys | Glu | Lys | Ile |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Thr | Leu | Glu | Ser | Lys | Lys | Cys | Asn | Ile | Ala | Lys | Lys | Ser | Asn | Lys | Ser |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Gly | Pro | Glu | Ser | Met | Asn | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

<210> 24

<211> 53

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 24

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Lys | Lys | Ser | Ile | Leu | Phe | Ile | Phe | Leu | Ser | Val | Leu | Ser | Phe | Ser |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Pro | Phe | Ala | Gln | Asp | Ala | Lys | Pro | Ala | Gly | Ser | Ser | Lys | Glu | Lys | Ile |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Thr | Leu | Glu | Ser | Lys | Lys | Cys | Asn | Ile | Val | Lys | Lys | Ser | Asn | Lys | Ser |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Gly | Pro | Glu | Ser | Met | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

<210> 25

<211> 53

<212> PRT

<213> Escherichia coli

<400> 25

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Lys | Lys | Ser | Ile | Leu | Phe | Ile | Phe | Leu | Ser | Val | Leu | Ser | Phe | Ser |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Pro | Phe | Ala | Gln | Asp | Ala | Lys | Pro | Ala | Gly | Ser | Ser | Lys | Glu | Lys | Ile |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Thr | Leu | Glu | Ser | Lys | Lys | Cys | Asn | Ile | Val | Lys | Lys | Asn | Asn | Glu | Ser |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Ser | Pro | Glu | Ser | Met | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

<210> 26

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 26

Asn Ser Ser Asn Tyr Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr
 1 5 10 15
 Gly Cys Tyr

<210> 27
 <211> 19
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetically generated peptide

<400> 27
 Asn Ser Ser Asn Tyr Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Trp
 1 5 10 15
 Gly Cys Tyr

<210> 28
 <211> 19
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetically generated peptide

<400> 28
 Asn Ser Ser Asn Tyr Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr
 1 5 10 15
 Gly Cys Tyr

<210> 29
 <211> 14
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetically generated peptide

<400> 29
 Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
 1 5 10

<210> 30
 <211> 14
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 <213> Artificial Sequence

<220>
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<400> 30
 Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Trp Gly Cys Tyr
 1 5 10

<210> 31
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 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetically generated peptide

<400> 31
 Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
 1 5 10

<210> 32
 <211> 15
 <212> PRT
 <213> Artificial Sequence

<220>
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<400> 32
 Asn Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
 1 5 10 15

<210> 33
 <211> 15
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetically generated peptide

<400> 33
 Asn Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Trp Gly Cys Tyr
 1 5 10 15

<210> 34
 <211> 15
 <212> PRT
 <213> Artificial Sequence

<220>
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<400> 34
 Asn Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
 1 5 10 15

<210> 35
 <211> 15
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetically generated peptide

<400> 35

Asn Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
 1 5 10 15

<210> 36

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 36

Asn Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
 1 5 10 15

<210> 37

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 37

Asn Cys Cys Glu Arg Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
 1 5 10 15

<210> 38

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 38

Asn Cys Cys Glu Lys Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
 1 5 10 15

<210> 39

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 39

Asn Ser Ser Asn Tyr Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr
 1 5 10 15
 Gly Cys Tyr Asp Phe
 20

<210> 40

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 40

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Ser | Ser | Asn | Tyr | Cys | Cys | Glu | Leu | Cys | Cys | Asn | Pro | Ala | Cys | Trp |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Gly | Cys | Tyr | Asp | Phe | | | | | | | | | | | |
| | | | 20 | | | | | | | | | | | | |

<210> 41

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 41

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Ser | Ser | Asn | Tyr | Cys | Cys | Glu | Phe | Cys | Cys | Asn | Pro | Ala | Cys | Thr |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Gly | Cys | Tyr | Asp | Phe | | | | | | | | | | | |
| | | | 20 | | | | | | | | | | | | |

<210> 42

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 42

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Ser | Ser | Asn | Tyr | Cys | Cys | Glu | Tyr | Cys | Cys | Asn | Pro | Ala | Cys | Thr |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Gly | Cys | Tyr | Asp | Phe | | | | | | | | | | | |
| | | | 20 | | | | | | | | | | | | |

<210> 43

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 43

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Ser | Ser | Asn | Tyr | Cys | Cys | Glu | Trp | Cys | Cys | Asn | Pro | Ala | Cys | Thr |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Gly | Cys | Tyr | Asp | Phe | | | | | | | | | | | |
| | | | 20 | | | | | | | | | | | | |

<210> 44

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 44

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Ser | Ser | Asn | Tyr | Cys | Cys | Glu | Arg | Cys | Cys | Asn | Pro | Ala | Cys | Thr |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Gly | Cys | Tyr | Asp | Phe | | | | | | | | | | | |
| | | | 20 | | | | | | | | | | | | |

<210> 45

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 45

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Ser | Ser | Asn | Tyr | Cys | Cys | Glu | Lys | Cys | Cys | Asn | Pro | Ala | Cys | Thr |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Gly | Cys | Tyr | Asp | Phe | | | | | | | | | | | |
| | | | 20 | | | | | | | | | | | | |

<210> 46

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 46

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Cys | Cys | Glu | Leu | Cys | Cys | Asn | Pro | Ala | Cys | Thr | Gly | Cys | Tyr | Asp | Phe |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |

<210> 47

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 47

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Cys | Cys | Glu | Leu | Cys | Cys | Asn | Pro | Ala | Cys | Trp | Gly | Cys | Tyr | Asp | Phe |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |

<210> 48

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 48

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Cys | Cys | Glu | Phe | Cys | Cys | Asn | Pro | Ala | Cys | Thr | Gly | Cys | Tyr | Asp | Phe |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

| | | | |
|---|---|----|----|
| 1 | 5 | 10 | 15 |
|---|---|----|----|

<210> 49
 <211> 16
 <212> PRT
 <213> Artificial Sequence

 <220>
 <223> Synthetically generated peptide

 <400> 49
 Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr Asp Phe
 1 5 10 15

 <210> 50
 <211> 16
 <212> PRT
 <213> Artificial Sequence

 <220>
 <223> Synthetically generated peptide

 <400> 50
 Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr Asp Phe
 1 5 10 15

 <210> 51
 <211> 16
 <212> PRT
 <213> Artificial Sequence

 <220>
 <223> Synthetically generated peptide

 <400> 51
 Cys Cys Glu Arg Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr Asp Phe
 1 5 10 15

 <210> 52
 <211> 16
 <212> PRT
 <213> Artificial Sequence

 <220>
 <223> Synthetically generated peptide

 <400> 52
 Cys Cys Glu Lys Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr Asp Phe
 1 5 10 15

 <210> 53
 <211> 17
 <212> PRT
 <213> Artificial Sequence

 <220>
 <223> Synthetically generated peptide

<400> 53

Asn Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr Asp
 1 5 10 15
 Phe

<210> 54

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 54

Asn Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Trp Gly Cys Tyr Asp
 1 5 10 15
 Phe

<210> 55

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 55

Asn Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr Asp
 1 5 10 15
 Phe

<210> 56

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 56

Asn Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr Asp
 1 5 10 15
 Phe

<210> 57

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 57

Asn Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr Asp
 1 5 10 15
 Phe

<210> 58

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 58

Asn Cys Cys Glu Arg Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr Asp
 1 5 10 15
 Phe

<210> 59

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 59

Asn Cys Cys Glu Lys Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr Asp
 1 5 10 15
 Phe

<210> 60

<211> 42

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetically generated oligonucleotide

<400> 60

cacaccatat gaagaaatca atattattta tttttctttc tg

42

<210> 61

<211> 46

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetically generated oligonucleotide

<400> 61

cacacctcga gttaggtctc catgctttca ggaccacttt tattac

46

<210> 62

<211> 69
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetically generated oligonucleotide

<400> 62
 gcatgaatag tagcaattac tgctgtgaat tgtgttgtaa tcctgcttgt accgggtgct 60
 attaataac 69

<210> 63
 <211> 69
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetically generated oligonucleotide

<400> 63
 tcgagttatt aatagcaccc ggtacaagca ggattacaac acaattcaca gcagtaattg 60
 ctactattc 69

<210> 64
 <211> 69
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetically generated oligonucleotide

<400> 64
 gcatgaatag tagcaattac tgctgtgaat attgttgtaa tcctgcttgt accgggtgct 60
 attaataac 69

<210> 65
 <211> 69
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetically generated oligonucleotide

<400> 65
 tcgagttatt aatagcaccc ggtacaagca ggattacaac aatattcaca gcagtaattg 60
 ctactattc 69

<210> 66
 <211> 21
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetically generated peptide

<221> VARIANT
 <222> 9

<223> Xaa = any amino acid; or Xaa = any amino acid
other than Leu; or Xaa = Phe, Trp, and Tyr; or
selected from from any other natural or
non-natural aromatic amino acid; or Xaa = Tyr

<221> VARIANT

<222> 1, 2, 3, 4, 5

<223> Xaa1 = Asn, Xaa2 = Ser, Xaa3 = Ser, Xaa4 = Asn,
Xaa5 = Tyr; or Xaa1-Xaa5 is missing; or Xaa1-Xaa4
is missing; or Xaa1 -Xaa3 is missing; or Xaa1 and
Xaa2 is missing; or Xaa1 is missing

<221> VARIANT

<222> 19, 20, 21

<223> Xaa 20 = Asp, Xaa21 = Phe or missing; or Xaa20 =
Asn or Glu and Xaa21 is missing; or X19-Xaa21 is
missing

<221> VARIANT

<222> (1)...(21)

<223> Xaa = Any Amino Acid

<400> 66

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Xaa | Xaa | Xaa | Xaa | Xaa | Cys | Cys | Glu | Xaa | Cys | Cys | Asn | Pro | Ala | Cys | Thr |
| 1 | | | | 5 | | | | 10 | | | | | | 15 | |
| Gly | Cys | Tyr | Xaa | Xaa | | | | | | | | | | | |
| | | | | 20 | | | | | | | | | | | |

<210> 67

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 67

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gln | Ser | Ser | Asn | Tyr | Cys | Cys | Glu | Tyr | Cys | Cys | Asn | Pro | Ala | Cys | Thr |
| 1 | | | | 5 | | | | 10 | | | | | | 15 | |
| Gly | Cys | Tyr | | | | | | | | | | | | | |

<210> 68

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 68

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Thr | Ser | Asn | Tyr | Cys | Cys | Glu | Tyr | Cys | Cys | Asn | Pro | Ala | Cys | Thr |
| 1 | | | | 5 | | | | 10 | | | | | | 15 | |
| Gly | Cys | Tyr | | | | | | | | | | | | | |

<210> 69

<211> 19
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetically generated peptide

<400> 69
 Asn Leu Ser Asn Tyr Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr
 1 5 10 15
 Gly Cys Tyr

<210> 70
 <211> 19
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetically generated peptide

<400> 70
 Asn Ile Ser Asn Tyr Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr
 1 5 10 15
 Gly Cys Tyr

<210> 71
 <211> 19
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetically generated peptide

<400> 71
 Asn Ser Ser Gln Tyr Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr
 1 5 10 15
 Gly Cys Tyr

<210> 72
 <211> 18
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetically generated peptide

<400> 72
 Ser Ser Asn Tyr Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly
 1 5 10 15
 Cys Tyr

<210> 73
 <211> 19

<212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetically generated peptide

<400> 73
 Gln Ser Ser Gln Tyr Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr
 1 5 10 15
 Gly Cys Tyr

<210> 74
 <211> 18
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetically generated peptide

<400> 74
 Ser Ser Gln Tyr Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly
 1 5 10 15
 Cys Tyr

<210> 75
 <211> 19
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetically generated peptide

<400> 75
 Asn Ser Ser Asn Tyr Cys Cys Glu Ala Cys Cys Asn Pro Ala Cys Thr
 1 5 10 15
 Gly Cys Tyr

<210> 76
 <211> 19
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetically generated peptide

<400> 76
 Asn Ser Ser Asn Tyr Cys Cys Glu Arg Cys Cys Asn Pro Ala Cys Thr
 1 5 10 15
 Gly Cys Tyr

<210> 77
 <211> 19
 <212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 77

| | | | | | | | | | | | | | | | |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Ser | Ser | Asn | Tyr | Cys | Cys | Glu | Asn | Cys | Cys | Asn | Pro | Ala | Cys | Thr |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Gly Cys Tyr | | | | | | | | | | | | | | | |

<210> 78

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 78

| | | | | | | | | | | | | | | | |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Ser | Ser | Asn | Tyr | Cys | Cys | Glu | Asp | Cys | Cys | Asn | Pro | Ala | Cys | Thr |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Gly Cys Tyr | | | | | | | | | | | | | | | |

<210> 79

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 79

| | | | | | | | | | | | | | | | |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Ser | Ser | Asn | Tyr | Cys | Cys | Glu | Cys | Cys | Cys | Asn | Pro | Ala | Cys | Thr |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Gly Cys Tyr | | | | | | | | | | | | | | | |

<210> 80

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 80

| | | | | | | | | | | | | | | | |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Ser | Ser | Asn | Tyr | Cys | Cys | Glu | Gln | Cys | Cys | Asn | Pro | Ala | Cys | Thr |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Gly Cys Tyr | | | | | | | | | | | | | | | |

<210> 81

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 81

| | | | | | | | | | | | | | | | |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Ser | Ser | Asn | Tyr | Cys | Cys | Glu | Glu | Cys | Cys | Asn | Pro | Ala | Cys | Thr |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Gly Cys Tyr | | | | | | | | | | | | | | | |

<210> 82

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 82

| | | | | | | | | | | | | | | | |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Ser | Ser | Asn | Tyr | Cys | Cys | Glu | Gly | Cys | Cys | Asn | Pro | Ala | Cys | Thr |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Gly Cys Tyr | | | | | | | | | | | | | | | |

<210> 83

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 83

| | | | | | | | | | | | | | | | |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Ser | Ser | Asn | Tyr | Cys | Cys | Glu | His | Cys | Cys | Asn | Pro | Ala | Cys | Thr |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Gly Cys Tyr | | | | | | | | | | | | | | | |

<210> 84

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 84

| | | | | | | | | | | | | | | | |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Ser | Ser | Asn | Tyr | Cys | Cys | Glu | Ile | Cys | Cys | Asn | Pro | Ala | Cys | Thr |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Gly Cys Tyr | | | | | | | | | | | | | | | |

<210> 85

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 85

Asn Ser Ser Asn Tyr Cys Cys Glu Lys Cys Cys Asn Pro Ala Cys Thr
 1 5 10 15
 Gly Cys Tyr

<210> 86

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 86

Asn Ser Ser Asn Tyr Cys Cys Glu Met Cys Cys Asn Pro Ala Cys Thr
 1 5 10 15
 Gly Cys Tyr

<210> 87

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 87

Asn Ser Ser Asn Tyr Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Thr
 1 5 10 15
 Gly Cys Tyr

<210> 88

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 88

Asn Ser Ser Asn Tyr Cys Cys Glu Pro Cys Cys Asn Pro Ala Cys Thr
 1 5 10 15
 Gly Cys Tyr

<210> 89

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 89

Asn Ser Ser Asn Tyr Cys Cys Glu Ser Cys Cys Asn Pro Ala Cys Thr
 1 5 10 15

Gly Cys Tyr

<210> 90

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 90

Asn Ser Ser Asn Tyr Cys Cys Glu Thr Cys Cys Asn Pro Ala Cys Thr
 1 5 10 15

Gly Cys Tyr

<210> 91

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 91

Asn Ser Ser Asn Tyr Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr
 1 5 10 15

Gly Cys Tyr

<210> 92

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 92

Asn Ser Ser Asn Tyr Cys Cys Glu Val Cys Cys Asn Pro Ala Cys Thr
 1 5 10 15

Gly Cys Tyr

<210> 93

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 93

Cys Cys Glu Ala Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
 1 5 10

<210> 94

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 94

Cys Cys Glu Arg Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
 1 5 10

<210> 95

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 95

Cys Cys Glu Asn Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
 1 5 10

<210> 96

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 96

Cys Cys Glu Asp Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
 1 5 10

<210> 97

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 97

Cys Cys Glu Cys Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
 1 5 10

<210> 98

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 98

Cys Cys Glu Gln Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
1 5 10

<210> 99

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 99

Cys Cys Glu Glu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
1 5 10

<210> 100

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 100

Cys Cys Glu Gly Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
1 5 10

<210> 101

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 101

Cys Cys Glu His Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
1 5 10

<210> 102

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 102

Cys Cys Glu Ile Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
1 5 10

<210> 103

<211> 14
 <212> PRT
 <213> Artificial Sequence

<220>
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<400> 103
 Cys Cys Glu Lys Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
 1 5 10

<210> 104
 <211> 14
 <212> PRT
 <213> Artificial Sequence

<220>
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<400> 104
 Cys Cys Glu Met Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
 1 5 10

<210> 105
 <211> 14
 <212> PRT
 <213> Artificial Sequence

<220>
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<400> 105
 Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
 1 5 10

<210> 106
 <211> 14
 <212> PRT
 <213> Artificial Sequence

<220>
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<400> 106
 Cys Cys Glu Pro Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
 1 5 10

<210> 107
 <211> 14
 <212> PRT
 <213> Artificial Sequence

<220>
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<400> 107
 Cys Cys Glu Ser Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr

1 5 10

<210> 108

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 108

Cys Cys Glu Thr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
1 5 10

<210> 109

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 109

Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
1 5 10

<210> 110

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 110

Cys Cys Glu Val Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
1 5 10

<210> 111

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 111

Gln His Asn Pro Arg
1 5

<210> 112

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 112

Val Gln His Asn Pro Arg

1 5

<210> 113

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 113

Val Arg Gln His Asn Pro Arg

1 5

<210> 114

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 114

Val Arg Gly Gln His Asn Pro Arg

1 5

<210> 115

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 115

Val Arg Gly Pro Gln His Asn Pro Arg

1 5

<210> 116

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 116

Val Arg Gly Pro Arg Gln His Asn Pro Arg

1 5 10

<210> 117

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 117

Val Arg Gly Pro Arg Arg Gln His Asn Pro Arg
 1 5 10

<210> 118

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 118

Arg Gln His Asn Pro Arg
 1 5

<210> 119

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<221> VARIANT

<222> 1, 2, 3, 4, 5, 8, 9, 12, 13, 14, 17, 19

<223> Xaa = any amino acid

<400> 119

Xaa Xaa Xaa Xaa Xaa Cys Cys Xaa Xaa Cys Cys Xaa Xaa Xaa Cys Xaa
 1 5 10 15
 Xaa Cys Xaa Xaa Xaa
 20

<210> 120

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<221> VARIANT

<222> 1, 2, 3, 4, 5

<223> Xaa1 = Asn, Xaa2 = Ser, Xaa3 = Ser, Xaa4 = Asn,
 Xaa5 = Tyr or missing; or Xaa1- Xaa4 is missing
 and Xaa5 = Asn

<221> VARIANT

<222> 8

<223> Xaa = Glu or Asp

<221> VARIANT
 <222> 9
 <223> Xaa = Leu, Ile, Val, Trp, Tyr or Phe

<221> VARIANT
 <222> 16
 <223> Xaa = Thr, Ala, or Trp

<221> VARIANT
 <222> 19
 <223> Xaa = Trp, Tyr, Or Leu or is missing

<221> VARIANT
 <222> 20, 21
 <223> Xaa20 = Asp, Xaa21 = Phe

<400> 120
 Xaa Xaa Xaa Xaa Xaa Cys Cys Xaa Xaa Cys Cys Asn Pro Ala Cys Xaa
 1 5 10 15
 Gly Cys Xaa Xaa Xaa
 20

<210> 121
 <211> 5
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetically generated peptide

<400> 121
 Asn Ser Ser Asn Tyr
 1 5

<210> 122
 <211> 30
 <212> PRT
 <213> *Yersinia enterocolitica*

<400> 122
 Gln Ala Cys Asp Pro Pro Leu Pro Pro Ala Glu Val Ser Ser Asp Trp
 1 5 10 15
 Asp Cys Cys Asp Val Cys Cys Asn Pro Ala Cys Ala Gly Cys
 20 25 30

<210> 123
 <211> 6
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetically generated peptide

<400> 123
 Lys Lys Lys Lys Lys Lys
 1 5

<210> 124

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetically generated peptide

<400> 124

Asp Lys Lys Lys Lys Lys Lys
1 5